

Application of Standards

The current FHWA regulation requires that the American Association of State Highway Transportation Officials (AASHTO) definition of a bridge be used when determining which structures are to be inspected and reported. Should the FHWA develop its own definition of a bridge for the purpose of inspection and reporting?

The current bridge definition has been around for many years and changing it may have many consequences.

Should the FHWA definition change the way the bridge length is determined or what the minimum bridge length should be for reporting purposes? Current AASHTO policy measures bridges from under copings of the abutments or spring lines of arches, or between extreme ends of openings for multiple boxes. The span opening then must be greater than 20 feet for reporting. What impact will the possible inclusion of more bridges be (1) on public authorities complying with this as an NBIS requirement, (2) or on the FHWA, which maintains the inventory, (3) or on the HBRRP funds?

Including in the bridge definition, bridges from ten to twenty feet would increase the number of bridges in the national inventory and could affect the way HBRRP funds are distributed. Is the addition of shorter span bridges warranted in terms of safety of the traveling public?

A public authority means a Federal, State, county, town, or township, Indian tribe, municipal or other local government instrumentality with the authority to finance, build, operate, or maintain toll or toll-free facilities.

Inspection Procedures

The current FHWA regulation includes the following:

- The AASHTO “Manual for Maintenance Inspection of Bridges”¹ will be used for determining load ratings for each bridge;
- If the States’ maximum legal load exceeds the load permitted under the operating rating then the bridge must be posted;
- A listing of bridges with fracture critical members along with information on location, description and inspection frequency must be maintained;
- Underwater members must be identified and special inspection performed no longer than every 5 years; and
- Bridges with other unique features must be identified and special safety inspections performed.

The results of underwater inspection of bridge piers since 1978 reveal that both construction materials used and the environment where the bridge is located impact

inspection frequency. Also, the results of underwater inspections of bridge pier piling in concrete lined irrigation channels suggest that little, if any, deterioration occurs in the 5 years between inspections. Bridge engineers have commented that it may be more economical to increase the time between inspections, while not impacting safety. Based on comments from bridge engineers, the FHWA is considering changing the 5 year underwater inspection intervals and developing intervals which are tied to pile or foundation materials as well as the environment where the bridge is located. What impact will changing the underwater inspection intervals have on public authorities complying with this as an NBIS requirement?

Increasing the time between underwater inspections seems warranted for bridges that are on piling and that have minimal chances of scour.

Scour, the leading cause of bridge failure in the United States, is not addressed directly in the current NBIS regulations, but is covered in a FHWA technical advisory.² The FHWA is considering providing guidance within the regulations to address this. Also, the FHWA is seeking comment on whether it should provide guidance for what public authorities should do after major storm events. These storm events can, in some cases, severely undermine bridge piers that may have lost bearing capacity because of localized scour. The FHWA is considering inclusion of the FHWA Technical Advisory T 5140.23 within the NBIS regulations. What, if any, would be the impact on public authorities complying with evaluation of scour at bridges criteria within the NBIS regulation?

Good question.

Frequency of Inspections

The current FHWA regulation requires that bridges be inspected every 2 years. The maximum interval can be increased to 4 years with FHWA approval after meeting certain conditions. Should the 4-year interval be increased so that more bridges would be eligible for the extended inspection cycle?

Completing the bridge inspection on a two-year basis seems appropriate on bridges ten years or older. Some efficiency may be gained by not requiring safety inspection on bridges less than 10 years old.

What would be a reasonable interval? What impact would this have on the safety of bridges?

Qualification of Personnel

The current FHWA regulation requires that the individual in charge of the inspection and reporting be a registered professional engineer (PE); or be qualified for registration as a

PE; or have a minimum of 10 years experience in bridge inspection in a responsible capacity and have completed certain training requirements. The individual in charge of the inspection team shall either meet the above qualifications or have a minimum of 5 years experience in bridge inspection assignments in a responsible capacity and have completed certain training requirements. Should the individual in charge of the inspection and reporting who is a PE be required to have the same training as bridge inspectors and have additional experience in bridge inspection?

Not necessarily. Although in some cases the individual in charge of the inspection and reporting should have at least some experience in bridge design, construction, or inspection.

In the current regulations, the registered professional engineer is not required to have specific bridge inspection training. Also, the discipline of the registered professional engineer is not specified. The FHWA is considering requiring that bridge inspections be performed by either a civil or structural engineer who is also a licensed professional engineer. Currently, the regulation permits professional engineers within other engineering disciplines to inspect highway bridges. Experience shows that only those engineers specifically trained to provide bridge inspection services are best equipped to conduct bridge inspections. Should the NBIS regulation be more specific as to the discipline of the professional engineer responsible for these bridge inspections and what impact would this change have on public authorities complying with this?

Yes, probably little impact as in most cases the individual in charge of the inspection and reporting has a civil and/or structural engineer.

Bridge engineers have indicated that inspection programs need to include an engineer in training (EIT) component. Bridge engineers feel that a graduate EIT engineer should qualify as a field team leader with appropriate bridge inspector's training and a minimum of 2 years bridge design, inspection or construction experience. According to the NBIS, a bridge inspector must have a minimum of 10 years experience in bridge inspection assignments in a responsible capacity. Bridge engineers would like clarification of the phrase "in a responsible capacity." Section 151 of title 23, U.S. Code, indicates that a training program for bridge inspectors shall be revised from time to time to take into account new and improved techniques. Bridge engineers have indicated that qualifications for inspectors should be modified to provide more training or experience in proportion to the complexity of the structure being inspected. The FHWA is considering requiring certification training in proportion to the complexity of the bridge structure being inspected, and making this a part of a requirement for inspectors under the national bridge inspection program. What impact would this change have on public authorities complying with this as an NBIS requirement?

May have some impact but this is a problem that does need to be addressed.

Bridge engineers have indicated that the NBIS does not adequately address qualification requirements for those performing underwater inspections. Should those performing underwater inspections be qualified licensed professional engineers?

Not necessary.

Current regulations do not stipulate that the inspector in the water must also be an engineer. What impact would these proposed changes have on public authorities complying with this?

Increased costs at what verifiable benefit.

Inspection Report

The current FHWA regulation states that AASHTO's "Manual for Maintenance Inspection of Bridges" be used (see footnote 1). This manual describes the guidelines for organizing the reports, written report requirements, and documentation of defects using photos and sketches. Bridge inspectors have indicated that those in management have made changes to their reports without having been in the field to view, first hand, the conditions of a particular bridge. The FHWA does not support this practice and believes any change to an inspection report should be made by the inspector who was out in the field. This procedure should be clearly covered in the NBIS. What if any would the impact be on public authorities complying with only allowing the inspector who was out in the field to change the inspection report as an NBIS requirement?

The individual in charge of the inspection and reporting has the ultimate responsibility rather than the field team leader. Any changes to field reports should be noted as such.

Inventory

The current FHWA regulation requires each State to maintain an inventory of all bridges in its State and submit the inventory to the FHWA annually. The data to be collected is outlined in the "Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges." ³ Requirements for entering new or updated data into the State's inventory or placing load restriction signs is set to 90 days for bridges under the States jurisdiction and 180 days for all other bridges. The FHWA believes that the procedures for bridge inventory are adequately written and require no modification. Should the reporting requirements for the NBIS be changed and what, if any, would the impact be on public authorities complying with this?

No changes required in that regard.